Inside NIDCD Newsletter

National Institute on Deafness and Other Communication Disorders
National Institutes of Health

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Winter 2010

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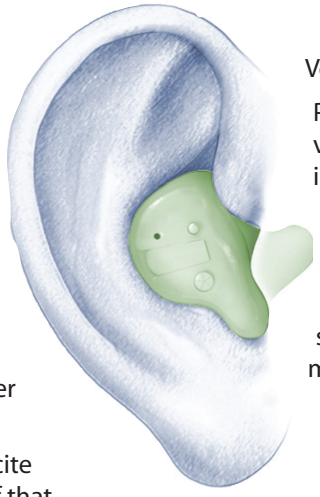
Feature Stories

Working Group Asks How to Make Hearing Health Care More Affordable, Accessible for Adults with Hearing Loss



Why don't more people who could use a hearing aid wear one? According to recent Healthy People 2010 statistics, only 16 to 17 percent of adults with hearing loss between the ages of 20 and 69 have worn hearing aids, while 25 to 29 percent of adults with hearing loss ages 70 and over have used them.

Hearing health researchers cite multiple reasons for the gulf that exists between those who need and those who have hearing aids, with cost seeming to be an important factor. According to a 2005 MarkeTrac VII survey of 3,000 adults with hearing loss who don't wear hearing aids, 64 percent of respondents named cost as a reason for forgoing treatment. A Hearing Loss Association of America spokesperson says that hearing aids can range from $1400 to $5000 apiece. Also, Medicare and most private insurance companies don't cover them. Considering that a hearing aid's lifespan is only 4-5 years, a hearing aid wearer could spend tens of thousands of dollars on aids over his or her lifetime.

This past August, the issue was explored in-depth during a three-day working group meeting sponsored by the NIDCD. The goal of the meeting, held at the Hyatt Regency in Bethesda, Md ., was to develop a research agenda that could help increase the accessibility and affordability of hearing health care for adults with mild to moderate hearing loss. "This working group focused on people who think they have hearing loss and want help," said Amy Donahue, Ph.D., deputy director of NIDCD's Division of Scientific Programs, program director of the hearing research portfolio, and organizer of the event. Judy Dubno, Ph.D., Medical University of South Carolina, and Lucille Beck, Ph.D., Department of Veterans Affairs, co-chaired the working group.

Participants represented a variety of viewpoints, including university and institutional researchers, audiologists, hearing aid manufacturers, local and global entrepreneurs, government regulators, and others. Researchers representing England, Australia, and Denmark, three countries that subsidize the cost of hearing aids and that have much higher rates of hearing aid usage, also took part.

"We want to complement and supplement, not replace, current paradigms and services," Dr. Donahue instructed the group. "Research questions that are appropriate for NIH to focus on include such areas as technology, intervention services, and service delivery, to name a few."

For the first two days, participants discussed potential new trends in hearing health care, ranging from telehealth, over-the-counter hearing aids, and convenient care clinics, such as those found in retail and grocery store chains, to new models in hearing aid fitting and distribution, including a self-adjusting hearing aid that could eliminate the need for a visit to the audiologist. Representatives of advocacy and professional organizations also were invited to share their suggestions for what the working group should focus on. On the last day, participants compiled a list of research recommendations that they believe could improve access, assessment and screening, and intervention in hearing health care.

A summary of the working group proceedings along with research recommendations can be found on the NIDCD Web site: **http://www.nidcd.nih.gov/funding/programs/09HHC/summary.htm**.

To add your name to **our e-mail list**, visit **http://www.nidcd.nih.gov/health/inside/**

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Tinnitus—the Noise in Your Head that Won't Go Away

Almost everyone has experienced tinnitus—what's commonly called ringing in the ears—at least once. Usually it goes away. But for some people it doesn't, and the noise can range from a soft whooshing to a piercing shriek that makes it impossible to think or concentrate, let alone fall asleep at night.

The problem with tinnitus, as Dr. Richard Tyler told an audience of more than 40 scientific researchers gathered for an NIDCD-sponsored workshop on the NIH campus in Bethesda, Md., is that because there is still no cure, people are told they just have to live with it. "Most of them do," says Tyler, a tinnitus researcher at the University of Iowa. "But that doesn't mean they like it." (See a list of the participants and the agenda for the meeting at **http://www.nidcd.nih.gov/funding/programs/09Tinnitus/summary.htm**.)

Almost everyone has experienced tinnitus—what's commonly called ringing in the ears—at least once.

Tyler arrived at this conclusion when his university sent out an alumni newsletter with a tiny paragraph tucked into its pages about one of his NIDCD grants. Within three months, he had received more than 300 e-mails from people across the country. "They were all pretty much the same," he said. "Something like, 'I've had tinnitus for about ten years and it doesn't bother me. But if you could fix it, I'd fly out to Iowa City tomorrow.'"

Because there are so many reasons for tinnitus, ranging from hearing loss to medications, diagnosing the cause or causes is a challenge. Figuring out how to help a patient is even more daunting, which is why NIDCD scientific program directors Roger Miller, Ph.D., and Gordon Hughes, M.D., decided to bring together researchers from the tinnitus and neural prosthesis communities for two days of brainstorming on the possibilities for developing devices to treat tinnitus. Fifteen presentations covered topics in basic science, FDA guidelines for device development, experimental clinical trials, and the growing numbers of veterans returning from Iraq and Afghanistan with tinnitus from bomb blast injuries.

Although tinnitus may begin in the ear, chronic tinnitus continues in the brain. How that happens is still being debated among researchers. There are many places along the path a hearing signal travels between the inner ear and the brain where things can go wrong to cause tinnitus. If we can understand how and where that happens, and why it causes tinnitus, it might be possible to find places on that path where some kind of therapeutic intervention could stop tinnitus in its tracks.

One of the more promising directions involves the use of electrical or magnetic stimulation on areas of the brain involved in hearing. Implantable "pacemaker" devices already exist to reduce the trembling of Parkinson's disease and the compulsions of obsessive-compulsive disorder (OCD). Similar devices could be used to normalize the neural circuits involved in tinnitus.

To encourage this kind of research, NIDCD is offering two different funding opportunities: for the development of new interventions (PAR-09-056), and for new or enhanced diagnostic, intervention, and treatment paradigms (PAR-09-057). "There's no question that there's plenty of room for new thinking and new ideas to help people with disabling tinnitus," said Roger Miller at the beginning of the meeting. By the end, researchers were clustered in the hallways, plotting how.

Read NIDCD fact sheets on "Hearing Aids" at **http://www.nidcd.nih.gov/health/hearing/hearingaid.asp**, and "Tinnitus" at **http://www.nidcd.nih.gov/funding/programs/09Tinnitus/summary.htm**. Read the grant announcement PAR-09-056 on the Internet at **http://grants.nih.gov/grants/guide/pa-files/PAR-09-056.html**, and find more on PAR-09-057 at **http://grants.nih.gov/grants/guide/pa-files/PAR-09-057.html**.

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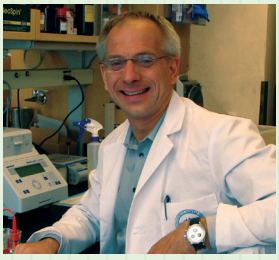
Recent Research and News

Four NIDCD Smell Grantees Receive Awards for Highly Innovative and High Impact Research

Timothy E. Holy, Ph.D.

Gene E. Robinson, Ph.D.

Stavros Lomvardas, Ph.D.



Mark W. Albers, M.D., Ph.D.

Four researchers who have received funding from the NIDCD were selected by the National Institutes of Health (NIH) as recipients of either the 2009 NIH Director's Pioneer Award or New Innovator Award. Both programs are part of the NIH Roadmap for Medical Research (**http://nihroadmap.nih.gov**), established in 2004, and support exceptionally creative scientists who take highly innovative, potentially high-impact approaches to major challenges in biomedical or behavioral research. This year marks the largest number of Pioneer and New Innovator awards in the program's history.

Timothy E. Holy, Ph.D., of the Washington University School of Medicine in St. Louis, and **Gene E. Robinson, Ph.D.,** of the University of Illinois at Urbana-Champaign and a member of the National Academy of Sciences, are Pioneer awardees. They will receive up to $2.5 million each in direct costs over 5 years.

Stavros Lomvardas, Ph.D., of the University of California in San Francisco, and **Mark W. Albers, M.D., Ph.D.**, of Massachusetts General Hospital, are New Innovator awardees. They will receive up to $1.5 million each in direct costs over 5 years. This year's awardees receive funds from the American Recovery and Reinvestment Act.

Read more about the awardees and their research on the Web at **http://www.nidcd.nih.gov/news/releases/09/10_05_09.htm**.

A Genetic Hunt Turns Up Deafness-Causing Mutation In a Gene Associated with Cancer

In genetics, as in life, surprising things can turn up in unexpected places. That was certainly the case when an international group of researchers found three mutations responsible for a form of hereditary deafness in a gene that is implicated in cancer. The research is published in The American Journal of Human Genetics. This surprising finding happened when researchers were scanning the DNA of over a thousand families with deaf children, searching for genes that could be responsible for inherited forms of deafness. Contributors to this study included researchers from the NIDCD, National Cancer Institute, Baylor College of Medicine, Houston, All India Medical Institute in India, and Punjab and Islamabad Universities in Pakistan. Read the announcement on the NIDCD Web site at **http://www.nidcd.nih.gov/news/releases/09/07_20_09.htm**, or read the abstract at **http://www.pubmed.gov**; search PMID: 19576567.

How Sensitive to Sweet Are You? New Taste Study Says Your Ability to Decipher 'Sweet' Relies Heavily on Two Letters in Your Genetic Code

If you're someone who likes to load up on sugar during your mid-morning coffee, 3:00 p.m. work break, and late-night snack, your genes might be trying to tell you something. You may be less sensitive to the taste of sweet than other people. New research published in Current Biology has found that our ability to detect sweetness not only depends on the taste receptors occupying our taste buds, but it also has a lot to do with two small bits of DNA hiding in our genetic code that regulate sweet taste receptor levels. This research was funded and conducted by the NIDCD along with researchers from Givaudan Flavors Corporation, Cincinnati, and the University of Virginia, Charlottesville. Read the announcement on the NIDCD Web site at **http://www.nidcd.nih.gov/news/releases/09/07_17_09.htm**, or read the abstract at **http://www.pubmed.gov**; search PMID: 19559618.

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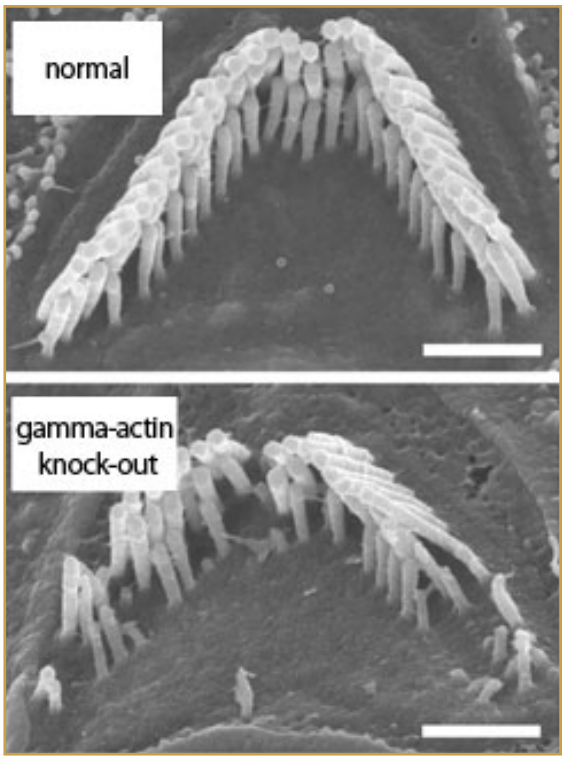
A new study of a knock-out animal model provides fresh insights into how noise damages the inner ear and how that damage can be repaired.

When the Noise Gets Too Loud, a Special Protein Helps Patch Up Inner Ear Damage

Excessive exposure to loud noise can have a devastating effect on the sensory cells in your inner ear, causing the stereocilia—the normally upright filaments sprouting from their tops—to be sheared off at the tip, to droop like a dehydrated daffodil, or to be wiped out entirely, depending on the noise level. A new study of a knock-out animal model provides fresh insights into how noise damages the inner ear and how that damage can be repaired. The study, published in the Proceedings of the National Academy of Sciences, was conducted by scientists from the NIDCD, the University of Minnesota, Michigan State University, the University of Kentucky, and Boys Town National Research Hospital in Omaha, Neb. Read the announcement on the NIDCD Web site at **http://www.nidcd.nih.gov/news/releases/09/06_24_09.htm**, or read the abstract at **http://www.pubmed.gov**; search PMID: 19497859.



An auditory stereocilia bundle from normal (top) and from gamma-actin-deficient (bottom) mouse
Credit: PNAS

NIDCD Highlights

Collins Meets Professional and Advocacy Groups at NIH

NIH Director Francis S. Collins, M.D., Ph.D., was greeted by a full house of representatives of professional societies and disease and patient advocacy organizations in a town hall meeting held in NIH's Natcher Auditorium on Wednesday, September 9. More than 200 organizations participated in the dialogue with the newly minted director, who used the opportunity to reiterate his commitment to basic science, innovation, and young scientists. Dr. Collins outlined the five major themes for his tenure as the head of the NIH: using genomics and cutting edge technology to understand fundamental biology and uncover the causes of specific diseases; using translational research to move

Francis S. Collins, M.D., Ph.D.

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basic science into new and better treatments; using scientific knowledge to benefit national health care reform; putting more emphasis on global health; and reinvigorating and empowering the biomedical research community.

Dr. Collins's presentation was followed by a Q&A session, during which he replied to more than a dozen questions from audience members. Dr. Collins invited participants to keep the conversation going, and offered an NIH e-mail address for this purpose. Send your questions to **NIH-LISTENS@nih.gov**.

Noisy Planet Campaign Cultivates Partnership with 4-H

A farm may seem like a peaceful place, but if you live or work on one, you know that isn't always the case. Plows, combines, tractors, and even some farm animals can create a noisy environment that puts a person's hearing at risk.

Recognizing this fact, the Noisy Planet campaign is partnering with 4-H, a highly successful outreach program of the United States Department of Agriculture's Cooperative State Research, Education, and Extension Service. The goal is to help spread the Noisy Planet message to parents and tweens (kids between the ages of 8 and 12) who live on a farm. Educational materials with an agricultural theme are being developed for distribution throughout the 4-H program's extensive network of professional staff and volunteers, including 4-H youth members, parents, extension agents, and others.

To kick off the collaboration, the Noisy Planet campaign introduced new materials for rural communities in October at the 2009 National Association of Extension 4-H Agents Conference in Rochester, N.Y. For more information, see the Noisy Planet Partners page at **http://www.noisyplanet.nidcd.nih.gov/partner**.

Planning for Healthy People 2020

Every 10 years, the U.S. Department of Health and Human Services (HHS) sets and monitors a group of national health objectives focusing on increasing the quality and years of healthy life, and eliminating health disparities. Healthy People 2020 is currently assessing the objectives of the past decade, measuring the impact of its prevention activity, and developing new 10-year targets.

HHS is seeking public input from communities across the country on the proposed Healthy People 2020 objectives. A public comment database on the proposed objectives is available. To see the list of proposed Healthy People 2020 Objectives, visit **http://www.healthypeople.gov/hp2020/Objectives/TopicAreas.aspx**. To learn more about the development of Healthy People 2020, visit their Web site at **http://www.healthypeople.gov/hp2020**.

Grants News

Major Changes to NIH Grant Applications

As part of the Enhancing Peer Review initiative, applications due on or after January 25, 2010, are required to download the new application forms, and follow new instructions—including shorter page limits and restructured application packages. These changes affect:

- All applications (including individual Career Awards) electronically submitted using application packages that combine the SF 424 (R&R) with PHS 398 components (e.g., PHS 398 Research Plan Component and PHS 398 Career Development Supplement Form);
- All electronically submitted Individual NRSA Fellowship applications using application

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packages that combine the SF 424 (R&R) with the PHS Fellowship Supplemental Form; and

- All applications using the paper PHS 398 application package.

See the original NIH Guide notice issued on September 16: NOT-OD-09-149 at **http://grants.nih.gov/grants/guide/notice-files/NOT-OD-09-149.html**.

NIDCD Grantee Receives NIH Challenge Grant

For many of the roughly 36 million American adults with some degree of hearing loss, a hearing aid does not provide enough help, and a cochlear implant risks permanently losing whatever residual hearing is left. These people struggle tremendously—particularly in noisy listening environments. **Christopher W. Turner, Ph.D.,** a professor of speech pathology and audiology, and otolaryngology – head and neck surgery at the University of Iowa, received an NIH Challenge Grant to conduct his research, *Optimizing the Combination of Electric and Acoustic Hearing*. The research is based on preliminary data involving a hybrid cochlear implant designed to preserve acoustic low-frequency hearing while allowing high-frequency sounds to be processed electrically in the same ear. The preliminary research has resulted in significantly improved performance on tests that measure understanding of speech in background noise and enhanced perception of music.

The NIH Challenge Grants in Health and Science Research are funded by the American Recovery and Reinvestment Act. NIH has designated at least $200 million for comparative effectiveness research to perform a rigorous evaluation of the impact of different options available for treating a given medical condition, such as competing drugs, or very different approaches, such as surgery and drug therapy. For more information, search the NIH Research Portfolio Online Reporting Tool at **http://projectreporter.nih.gov**, and look for grant number 1RC1DC010696-01.

New Widget Helps You Find NIDCD Projects Funded by ARRA

Finding a list of all projects funded through NIDCD's portion of American Recovery and Reinvestment Act (ARRA) funds is as easy as a single click. A new widget application allows you to see this information in an instant. You can find the widget in the right margin of NIDCD's ARRA Web page: **http://www.nidcd.nih.gov/recovery.htm**.

Meetings of Interest

ARO 33rd MidWinter Meeting

February 6-10
Anaheim, California

The Association for Research in Otolaryngology (ARO) is holding its primary scientific meeting in the Disneyland Hotel. ARO is an international association of scientists and physicians dedicated to scientific exploration among all of the disciplines in the field of otolaryngology. Research efforts involve the ear, nose, head, neck, and related functions including hearing, balance, speech, taste, and smell among others. A wide range of scientific approaches is represented, including biochemical, physiological, behavioral, developmental, and evolutionary. Visit their Web site at **http://www.aro.org/mwm/mwm.html**.

National Hearing Conservation Association (NHCA), 35th Annual Conference

February 25-27
Orlando, Florida

"Exploring the World of Hearing Loss Prevention" is the theme of this year's National Hearing Conservation Association (NHCA) annual conference. Field experts will share relevant topics including an international perspective on the latest research on hearing loss prevention, public and personal health issues related to noise exposure and hearing loss, recent public health and military initiatives for hearing loss prevention, new and upcoming legislation and recommendations, and more. Also this year, the

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National Institute for Occupational Safety and Health, in partnership with NHCA, will present the first Safe-in-Sound Award for Excellence and Innovation in Hearing Loss Prevention. The award is to be presented to organizations and businesses with the best hearing loss prevention program in the manufacturing, service, and construction sectors.

For more information on the NHCA annual conference, go to **http://www.hearingconservation.org**. For information on the Safe-in-Sound Award, go to **http://www.safeinsound.us**.

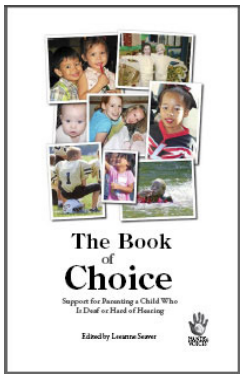
Beyond NIDCD: News from Other Organizations

New Web Site for Deaf and Hearing Interpreters Working in Mental Health

The Mental Health Interpreter Training Project in Alabama recently launched its new Web site. The Web site includes information about training and practices, and can be accessed at **http://www.mhit.org**.

Hands & Voices Presents "The Book of Choice"

The Book of Choice: Support for Parenting a Child Who Is Deaf or Hard of Hearing offers family stories



from parents sharing their experiences on raising a child with hearing loss. It focuses on what they wish they'd known right after the diagnosis. It features diverse ethnicities and communication modes and methods. To order, go to the Hands & Voices' Web site at **http://www.handsandvoices.org/resources/products.htm**.

New Resources

NIDCD Offers Updated Fact Sheets on Taste, Smell, Autism

A taste or smell disorder can have a negative effect on a person's health and quality of life. They are also very closely related. Some people who go to the doctor because they think they've lost their sense of taste are surprised to learn that they have a smell disorder instead. To learn more about your sense of smell, read the NIDCD fact sheet "Smell Disorders" at **http://www.nidcd.nih.gov/health/smelltaste/smell.asp**, and to learn about taste, read "Taste Disorders" at **http://www.nidcd.nih.gov/health/smelltaste/taste.asp**.

Children with autism may have difficulty developing language skills and understanding what others say to them. They also may have difficulty communicating nonverbally, such as through hand gestures, eye contact, and facial expressions. Read the updated fact sheet "Communication Problems in Children with Autism" at **http://www.nidcd.nih.gov/health/voice/autism.htm.**

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NIDCD Announces 2009-2010 Seminar Series

The NIDCD Division of Intramural Research presents a seminar series focusing on the basic mechanics of auditory function and hearing disorders. The seminars bring to the NIH campus speakers from universities around the country and all over the world. Their topics cover many of the fields studied by NIDCD scientists, including basic science, genetics, immunology, electrophysiology, and many others.

The seminar series is held on the first Tuesday of each month from September 2009 through June 2010 in Room 1A51, Building 49. The series provides an opportunity to strengthen scientific interactions both within the NIDCD and with the extramural community. See the NIDCD calendar on the Web for more details at **http://www.nidcd.nih.gov/news/calendar.asp**.

Pre-Order Copies of NIDCD 2010-2011 Resources Directory

Be the first to receive the most recent version of the *NIDCD Resources Directory*. The directory is a vital reference for health professionals, patients, and their families and includes details about nearly 150 national organizations providing information, services, or advocacy on communication disorders.

The directory is free of charge. To pre-order, call the NIDCD Information Clearinghouse at (800) 241-1044 or TTY at (800) 241-1055. You can also send an e-mail to **nidcdinfo@nidcd.nih.gov**.

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